State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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April 24, 2003

Mr. Scot Schwandt
Mr. Gerald Waelti
Wisconsin Asphalt Pavement Association
122 State Street Suite 507
Madison, WI 53703

Subject: November 2001 Hot Mix Asphalt Plant Emission Inventory Agreement

Dear Mr. Schwandt and Mr. Waelti:

The purpose of this letter is to tell you about a correction made to the SO_2 emission factor and other calculation adjustments needed to process the 2002 Air Emission Inventory that is consistent with our work on 2001 HMA agreement. You may receive calls from asphalt plant owners at the end of May when they receive their emission summaries and we wanted you to be aware of this. We have also heard concerns from DNR staff regarding emission calculations for particulate matter (PM, and PM_{10}) and carbon monoxide (CO), and we would like to discuss this with you prior to a future Environmental Technology Transfer Technology (ETTT) Committee meeting and also at the next ETTT meeting.

Air Emission Inventory-Hot Mix

Background

DNR, WAPA, and other hot mix asphalt plant owners agreed to calculate air emissions for hot mix asphalt plants based on guidance supplied in the document**, Hot Mix Asphalt Plant, Air Emission Inventory Guidance, November 2, 2001**, DNR Document Number AM-317 2001.
(See: http://www.dnr.state.wi.us/org/aw/air/emission/calculation_hot_mix_asphalt.htm)

Because the guidance document was completed after the 2001 production season, the guidance document essentially applied to the 2002 hot mix asphalt season. The hot mix asphalt guidance document required hot mix asphalt plant owners and operators to calculate weighted percent sulfur content of fuel oils used while manufacturing asphalt at the hot mix asphalt mixers. DNR in turn agreed to supply a 50% sulfur dioxide removal credit for the hot mix asphalt plant mixer process based on information obtained through testing from hot mix asphalt plants in Wisconsin and Michigan. After this agreement was completed, we discovered we needed workarounds in our computer system to calculate sulfur dioxide emissions based on the guidance document.

Correction to SO_2 Emission Factor

In the hot mix asphalt plant guidance, a company was reported the tons of asphalt produced and then a weighted percent sulfur of the fuel oil used to produce the asphalt for the asphalt plant mixer calculations. The emission calculation for the asphalt plant mixer was:

Emission (SO_2) = asphalt produced (tons) x 26.784 lbs SO_2/ton product produced x weighted per cent sulfur x 50% removal credit

Our computer system was developed to either calculate emissions from a production source (throughput) or a fuel burning source (gallons of fuel). Our computer system does not correct the weighted per cent sulfur to the correct number needed to calculate the SO_2 emissions. For example a 1% S fuel would be assumed to be 1 by the computer when it should be 0.01 for the calculation. In order to fix this problem, the emission factor was divided by 100 and so the emission factor we use for the asphalt mixer will be 0.26784 lbs SO_2/ ton asphalt produced and not 26.784 lbs SO_2/ton asphalt produced. The total emissions do not change with this correction to deal with how our computer system processes emissions.

NO_x, CO, & ROG Emissions

Nitrogen oxide (NOx), carbon monoxide(CO) and reactive organic gasses (ROG) emissions will be calculated, per our agreement shown in the inventory guidance from November 2001, from the type and amount of fuel burned and not from the tons of product produced. Since this information was not requested on the emission inventory this year, we will determine the amount of fuel burned by multiplying the amount of asphalt produced by 1.8. The 1.8 gallon per ton figure was used to calculate the emission factor on page 14 of the guidance document. This calculation will be used and hot mix asphalt plant owners and operators will be asked to supply a gallon used figure when they receive their emission summary if the estimate is different than what was actually used at the hot mix asphalt plant in 2002.

Please see the example of an asphalt plant 2002 emission summary report for Payne and Dolan #5 attached to this letter. The information of interest starts on Page 6 and ends of Page 9 of this summary report. P30, Process 02 was added to the asphalt mixer. This process was assigned a source classification code (SCC) of 10200502 which corresponds to USEPA emission factors for NO_x, CO and ROG emissions for distillate fuel oil (refer to page 8). The 625,422.6 gallon annual fuel use number is calculated from P30-17 (refer to page 9)--347,457 tons asphalt X (1.8 gal fuel oil/ton asphalt produced).

In the interest of time and work hours, for both the Department and the hot mix asphalt owners and operators, we are completing this calculation for NO_x, CO and ROG in the asphalt mixer based on an approximation (i.e. 193,031 gallons). If these approximations are not accurate, we will change the numbers to the actual values after receiving information from the company. An explanation of these changes and what the company needs to do to change this information will be supplied to the company when they receive their 2002 air emission summary for the particular facility.

Particulate Emission Factor

Before the 2001 hot mix asphalt agreement, the asphalt mixer was linked to a baghouse which controlled the PM and PM_{10} emissions. Because of the new calculation, which makes the linkage of a control to a combination fuel/process source not possible, we have resorted to using particulate emission factors from EPA's Table 11-1.1 of AP42 for fabric filters. The PM emission factors are 0.042 lb PM/ton asphalt produced and 0.027 lb PM_{10}/ton asphalt produced. Once again, these changes are due to our computer system processing. You can review this information by going to the following website:

http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s01.pdf

Discussion Areas for Future WAPA ETTT Meeting

We have two additional subjects linked to the hot mix asphalt mixer that we would like to discuss a future WAPA ETTT Meeting.

Condensable Particulate Emissions

The first subject regards the emission factors for Total PM and PM_{10}. The USEPA emission factors of 0.042 lb PM/ton asphalt produced and 0.027 lb PM_{10}/ton asphalt produced, discussed above, are factors developed from numerous stack tests. Stack testing information from the front half (filterable) and the back half (condensable) were combined to develop these emission factors. DNR does allow companies to substitute stack-testing information for USEPA emission factors. These stack test results generally do not include the back half information. Hence, condensable emissions may be under reported. You may be aware that state of Minnesota already requires condensable particulate testing and then calls the catch $PM_{10.}$ We would like to discuss the substitution of stack test information for these AP42 emission factors so that all can be assured that we are being consistent when these emissions are calculated.

A variety of options exist. If you would like to use your stack test data, you will need to include the back half portion as well. Another possibility is to use stack testing results (front half), and adding an additional emission factor for the condensable portion (back half). This can be developed from AP-42 Section 11.1 data

Carbon Monoxide

The second subject involves the calculation of carbon monoxide. Currently, emission factors for fuel combustion are used to generate CO emissions data. As a part of required burner optimization procedures, carbon monoxide is typically measured through a variety of portable combustion analyzers and reported. The Department has become aware of wide variability in CO values (ppm), and disparities with burner emission factors. This may be another instance of under or over reporting. The Department also wants to discuss the reasons for this and the potential use of formally approved stack test methods to resolve these differences.

Summary

We made a correction to the SO_2 emission factor for asphalt mixers, which may result in questions from hot mix asphalt companies after they receive their preliminary 2002 air emission summaries in April or their final 2002 air emission summaries at the end of May. We calculated fuel usage based on asphalt produced in 2002 in order to process total emissions for NOx, CO and ROG emissions. In a future WAPA ETTT meeting, we would also like to discuss the calculation of CO and particulate emissions from hot mix asphalt plant mixers.

If you have any questions about this letter, please contact either Ralph Patterson at 267-7546 or me at 266-2060.

Sincerely,

Patrick Kirsop
Small Business Section Chief

cc: Jerry Rodenberg-CO/8
Ron Daggett-SCR-Willy/Blount
Tom Ponty-WCR-Eau Claire
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